Dominion – Warren County Power Station

Prevention of Significant Deterioration Permit

DEQ Response to Comments Document

December 7, 2010

The Department of Environmental Quality (DEQ) comment period ran from October 10, 2010 through November 24, 2010. Written comments were received on the draft Prevention of Significant Deterioration permit for the Dominion – Warren County Power Station (Dominion – WCPS) proposal to construct and operate an electric generating facility in Warren County, Virginia. During the public comment period, 120 written and 10 oral comments were received. The written comments included letters from the U. S. Department of the Interior, Shenandoah National Park Trust, County of Warren, County of Clarke, Dominion, five from environmental advocacy groups, one local business, and 103 from citizens, of which 70 were similar electronic mail form letters from throughout Virginia and a few from neighboring states. Ninety-eight (98) commenters requested that the State Air Pollution Control Board make the final permit determination rather than DEQ.

The public comment period included a public hearing held on November 9, 2010. Thirty-nine persons attended the hearing. Fourteen of the attendees offered testimony and four of those submitted sets of written comments and one map, all of which were entered into the record by the Department. Of the 14 oral comments provided at the hearing, 9 were in support of the proposed facility.

DEQ has reviewed all of the testimony as well as written comments received. The concerns expressed are summarized below, with the Department's response immediately following each item.

Table of Contents

List of acronyms

AQRV – Air Quality Related Value

BACT – Best Available Control Technology

CAA – Clean Air Act

CAIR – Clean Air Interstate Rule

CAM – Compliance Assurance Monitoring

CO – Carbon monoxide

CPV – Competitive Power Ventures

DEQ – Department of Environmental Quality

EGU – Electric Generating Unit

EPA – Environmental Protection Agency

FLM – Federal Land Manager

FLAG – Federal Land Managers' Air Quality Related Values Work Group

HAP – Hazardous Air Pollutant

HRSG – Heat Recovery Steam Generator

LAER – Lowest Achievable Emission Rate

LNG – Liquefied Natural Gas

NAAQS – National Ambient Air Quality Standard

NESHAP – National Emissions Standards for Hazardous Air Pollutants

NLEV – National Low Emission Vehicle

NO_X – Nitrogen Oxides

NPS – National Park Service

PEC – Piedmont Environmental Council

PM-10 – Particulate Matter having an aerodynamic diameter of ten microns or less

PM-2.5 – Particulate Matter having an aerodynamic diameter of 2.5 microns or less

ppb – parts per billion

ppm – parts per million

ppmvd – parts per million by volume (dry basis)

PSD – Prevention of Significant Deterioration

RACT – Reasonably Available Control Technology

RBLC – RACT/BACT/LAER Clearinghouse

SAAC – Significant Ambient Air Concentration

SAPCB – State Air Pollution Control Board

SCC – State Corporation Commission

SCR – Selective Catalytic Reduction

SELC – Southern Environmental Law Center

SIP – State Implementation Plan

SNP – Shenandoah National Park

SO_2 – Sulfur dioxide

TMDL – Total Maximum Daily Load

VEE – Visible Emissions Evaluation

VEPCO – Virginia Electric and Power Company

VOC – Volatile Organic Compound

WCPS – Warren County Power Station

Issue 1: General Site Suitability

Comment: Stated simply, respondents believe that, regardless of steps taken to mitigate environmental impacts, there are certain places where a power plant should not be sited, and less than five miles from a national park suffering from air quality problems is one such place.

Response: Dominion's application is subject to the Prevention of Significant Deterioration (PSD) Rule (9 VAC 5 Chapter 80, Part II, Article 8), which does not include provisions to deny the application solely due to the facility's location relative to the National Park. The Dominion - WCPS project is subject to preconstruction review under the State's PSD permit program, which is approved by EPA under 40 CFR 51.166 to implement 40 CFR 51.21 (the federal PSD regulation). It is important to clarify that the PSD permit program does not strictly prohibit growth. Rather, one of the basic goals of the PSD program is to ensure economic growth occurs while still preserving existing air quality. This goal is achieved by the application of both a rigorous air quality demonstration and control technology review prior to the construction of the new source in order to minimize the project's emissions. The PSD regulation clearly contemplates that such growth will occur in proximity to Class I areas by establishing more stringent Class I air quality requirements and by codifying the affirmative role of the Federal Land Manager (FLM) to protect air quality related values (AQRVs) in the Class I areas.

For example, PSD regulations establish an increment (an allowable increase in ambient concentration above a baseline level) for each regulated criteria pollutant for both Class I and Class II areas. The Class I area increments are much smaller than the Class II increments (with Class I increments ranging from one-fourth to as small as 1/20th of the Class II values). The air quality analyses performed by Dominion in support of its application show that the proposed facility would not cause an exceedence of the more stringent Class I allowable increment for any pollutant.

PSD regulations also require an analysis of a proposed project's effects on AQRVs within a Class I area. The concentration at which a pollutant adversely impacts an AQRV can vary between Class I areas because the sensitivity of the same AQRV often varies between areas. The specific AQRVs reviewed for the Dominion – Warren County Power Station project were chosen by the FLM (the National Park Service(NPS)) based on air quality conditions at Shenandoah National Park (SNP). After reviewing the analyses, the FLM determined that visibility at SNP would be adversely affected by a coherent plume due to emissions from the WCPS and nitrogen deposition from the WCPS would adversely affect stream water chemistry at SNP. However, in coordination with DEQ, the NPS and Dominion reached a mutually acceptable emissions reduction plan that will result in a net environmental benefit at SNP, thereby adequately mitigating the WCPS adverse impacts on aquatic resources at the park and alleviating the FLM's adverse visibility impact concerns.

Issue 2: Impacts on Air Quality Related Values (AQRVs) in Shenandoah National Park (SNP)

Comment: The National Park Service (NPS) concludes that the impact of the project's emissions constitutes an adverse impact upon visibility in the SNP. The NPS is also concerned about the contribution of additional acidifying pollutants into the aquatic ecosystems and state that the project, as proposed, would have an adverse impact on the aquatic systems in the SNP.

The NPS acknowledges that all parties (NPS, DEQ and Dominion) have reached a mutually acceptable emissions reduction plan that will result in a net environmental benefit in the SNP. The NPS concludes that although plume impacts cannot be directly offset with emissions reductions in other locations, visibility impact concerns are alleviated when sufficient emission reductions are achieved to demonstrate a net environmental benefit to the SNP.

The three major elements of the mitigation plan, as identified in the NPS comments, are as follows:

1. Dominion shall permanently cease all permitted SO_2 and NO_X emissions at North Branch Power Station in Grant County, West Virginia. Based on the actual emissions in 2007-2008 and the distance and direction of North Branch Power Station from the Park, these reductions shall result in an Emission Offset of 243 tons per year (TPY) that is applied to the total annual NO_X limit. Specifically, these emissions are being offset at a ratio of 10:1 based on the modeling conducted by the NPS. Neither the permitted nor actual SO_2 and NO_X emission reductions from the North Branch Power Station may be used as Emissions Offsets for any other purpose.

2. Dominion shall retire permanently the 175 TPY of NO_X offsets procured from World Kitchen in Martinsburg, West Virginia, as approved by the DEQ by letter of 11/17/07. Based on the distance and direction of World Kitchen from the Park, this retirement of emission reduction credits shall result in 17.5 TPY emission offsets toward the total annual NO_X limit. Specifically, these emissions are being offset at a ratio of 10:1 based on the modeling conducted by the NPS.

3. Dominion shall secure and retire Eligible SO_2 Allowances, Eligible NO_X Allowances, or Emission Reduction Credits in the amount equivalent to 70.2 TPY of Emission Offsets toward the total annual NO_X limit.

Several respondents were concerned over the proximity of the proposed facility to the SNP and about the potential impact on AQRVs (e.g., soils, aquatic resources) resulting from acidic deposition. Respondents also cited information from the National Parks Conservation Association 2003 study of SNP studies which states that acid rain has "significantly affected soils and aquatic resources in the Park and remains the number one threat to overall water quality."

Respondents stated that the NPS is the Federal Land Manager (FLM) with the responsibility of protecting the AQRVs within the SNP. As a result, it is essential that DEQ staff, the State Air Pollution Control Board (SAPCB), and Dominion work with the NPS to assure that SNP is fully protected. If the NPS makes an adverse impact finding and concludes that the power plant's impacts cannot be mitigated, then the SAPCB should reject Dominion's application.

Comments were received that suggested securing coal-unit retirements as part of the mitigation plan.

Respondents also reiterated that the modeling of the proposed facility demonstrated nitrogen acid deposition impacts to already impaired streams in the northern watersheds within the SNP.

Response: DEQ concurs that the mitigation plan proposed by the NPS in its comments fully addresses the issues related to the proposed facility's impact within the SNP. DEQ has fully incorporated this mitigation plan in the final draft permit using the NPS recommended language.

Both the NPS and DEQ have stated concerns about acidic deposition in the SNP. DEQ continues to evaluate and respond to these issues as part of its agency obligations under the U.S. Clean Water Act. For example, DEQ issues its 305(b)/303(d) Water Quality Assessment Integrated Report (Integrated Report) every 2 years. This report provides a summary of the water quality conditions in Virginia, including SNP. DEQ develops and submits this report to the EPA every even-numbered year. The report satisfies the requirements of the U.S. Clean Water Act sections 305(b) and 303(d) and the Virginia Water Quality Monitoring, Information and Restoration Act. The goals of Virginia's water quality assessment program are to determine whether waters meet water quality standards and to establish a schedule to restore waters with impaired water quality. Additional information can be found at the following link:

http://www.deq.virginia.gov/wqa/

Recently collected stream samples, although not certified by DEQ, indicate that stream acidification in the SNP continues to impact water quality. For example, the Shenandoah Watershed Study (SWAS) program conducts watershed research and monitoring in the Shenandoah National Park as well as other areas. The SWAS program studies acidic deposition in sensitive streams, most of which support reproducing populations of the native brook trout. The SWAS program concluded that stream water acidification is a continuing problem in Virginia's forested mountain watersheds. A link to the SWAS program is provided below:

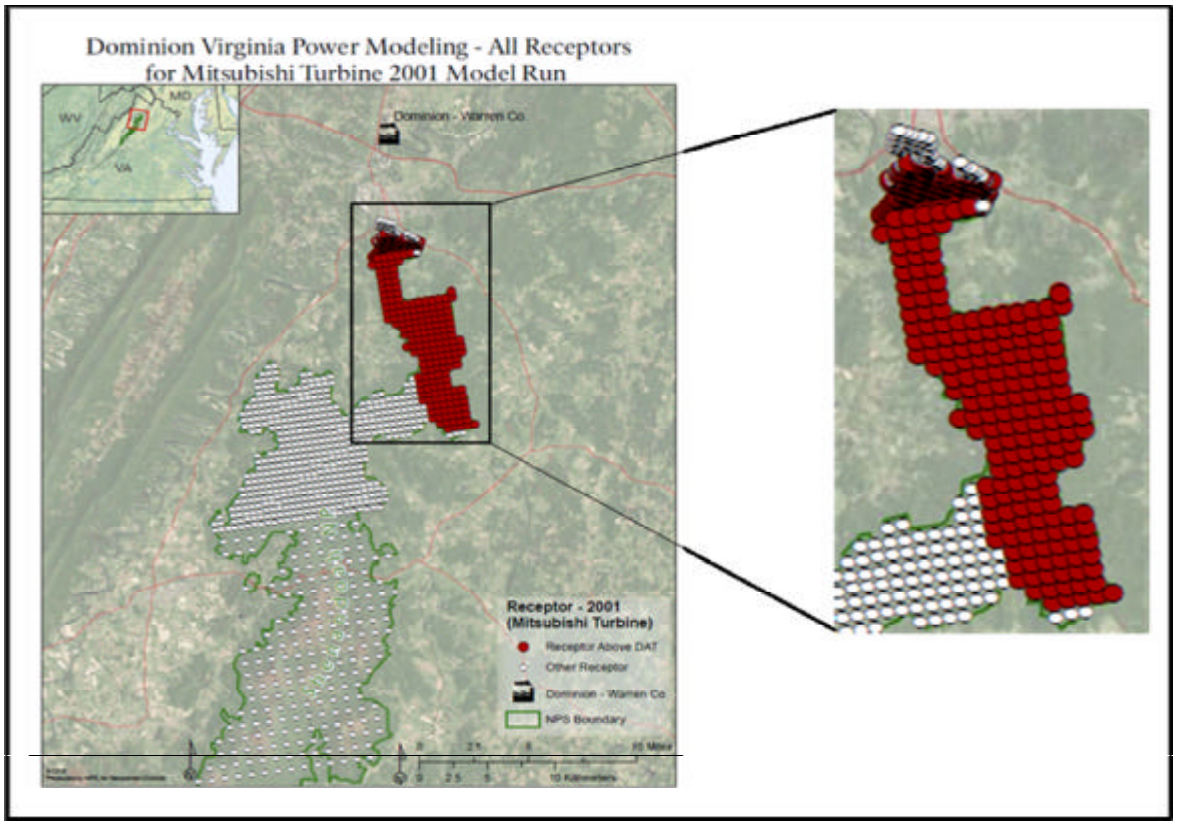
http://swas.evsc.virginia.edu/

As previously stated, DEQ recognizes the importance of protecting the SNP from the impacts of acidic deposition. The proposed Dominion facility is subject to Acid Rain permitting

requirements established under Title IV of the 1990 Clean Air Act Amendments - The Acid Rain Program. The overall goal of the Acid Rain Program is to achieve significant environmental and public health benefits through reductions in emissions of sulfur dioxide (SO_2) and nitrogen oxides (NO_X), the primary causes of acid rain. The proposed facility is fueled by natural gas, the least polluting of the possible fuel sources. As a result, the Acid Rain requirements associated with this power plant will be minimal. The Acid Rain Program requirements being implemented regionally will likely result in significant long-term environmental improvements in agricultural lands, lakes, streams, and forests in Virginia and the SNP.

The NPS determined the significance of the proposed project's contribution to acidic deposition by comparing the project's impact (based on CALPUFF modeling) to the Deposition Analysis Threshold (DAT) for nitrogen. The DAT for the eastern U.S., as established by the NPS, is 0.010 kilograms/hectare/year (kg/ha/yr) for nitrogen. The DAT is a screening tool used by the NPS to evaluate a new or modified source's predicted contribution to deposition in a Class I area. A DAT is defined as the additional amount of deposition within an area, below which estimated impacts from a proposed source are considered negligible. In other words, if the source has a predicted deposition impact below the DAT, the NPS will consider that impact to be negligible. In cases where a source's impact equals or exceeds the DAT, the NPS will make a project-specific assessment of whether the projected increase in deposition would likely result in an "adverse impact" on resources considering existing AQRV conditions, the magnitude of the expected increase, and other factors as defined in its FLAG 2010 guidance document (FLAG 2010. U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service. 2010. Federal land managers' air quality related values work group (FLAG): phase I report—revised. Natural Resource Report NPS/NRPC/NRR—2010/232. National Park Service, Denver, Colorado. October 2010).

The NPS has expressed concern that locations within the northern end of the SNP had predicted nitrogen deposition greater than 0.020 kg/ha/yr, a value more than twice the DAT. The following figure illustrates the receptors with modeled impacts greater than the DAT. The maximum modeled nitrogen deposition at any receptor was 0.022 kg/ha/yr.



DEQ agrees additional nitrogen deposition resulting from emissions from the proposed project may adversely impact streams and aquatic biota already impaired because of acidification. The NPS comments do not specifically quantify what impact a loading of 0.022 kg/h/yr (maximum receptor) would have on a stream's pH. DEQ also supports a modeling approach which averages impacts across an individual watershed as opposed to the standard NPS practice of using the maximum impact at any one receptor to determine significance.

The NPS correctly states that DEQ has classified Jeremy's Run as a watershed in the northern portion of the SNP that is impaired for pH. It is important to note, however, that the proposed facility's impact within Jeremy's Run is below the DAT; therefore, it is not expected to significantly contribute to acidic deposition in this particular watershed using the NPS criteria.

Lastly, the pH special standard that currently applies to Jeremy's Run and other streams in the SNP is 6.5-9.5. This standard range is based on the assumption of limestone substrate in the western portion of Virginia, namely in the lower elevations of the Shenandoah Valley. Many of the streams in the SNP, such as Jeremy's Run, are defined as headwaters where the substrate is not limestone. Therefore, streams located at the higher elevations (i.e., both the western and eastern slopes of the SNP) do not fit this description. In fact, the United States Forest Service (USFS) had a number of their streams with a similar substrate to those in the SNP reclassified in the last triennial review of water quality standards. These USFS streams are now subject to the statewide pH standard of 6-9.

Please refer to Issue 7: Visibility Impacts (Coherent Plume Analysis & Regional Haze) for a discussion on the impact of the project's emissions upon visibility in the SNP.

Issue 3: Offset Ratios

Comment: Several respondents expressed concern regarding the offset ratios contained in the draft permit as well as the geographic region that would be used to identify offsets to be included in the mitigation plan. Respondents expressly stated the desire to find offsets "in close proximity and in a ratio sufficient to satisfy the SNP concerns."

Respondents also commented that "in 2004, the Air Board mandated that all of the power plant's smog-forming nitrogen oxide emissions would be offset by reductions from other sources within the immediate vicinity of the plant and that would directly benefit Shenandoah National Park. Now, because of the enormous increase in size of the plant, Dominion states it is unable to obtain 100% of these essential offsets from within the surrounding area. Instead, it seeks to take credit for offsets that might be obtained from sources hundreds of miles away."

Respondents desired to strengthen the draft mitigation plan ratios from 1.15:1 to 2:1 for sources close to the SNP and 3:1 if the facilities are farther away.

Respondents suggested that the offset ratios be strengthened in the draft permit by obtaining nitrogen oxide offsets from other sources within close proximity to the SNP. Additionally, concerns have been raised as to whether the offset provisions in the draft permit are sufficient to mitigate the adverse impacts to AQRVs in the SNP.

Respondents commented that "the ratio of offsets, combined with the large radius of the area from which offsets might be obtained, are not sufficient to address impacts to the SNP" and that "it is essential that input from the National Park Service, which is the expert agency with primary responsibility for protecting Shenandoah, be used to guide this analysis."

Respondents stated that the CAIR rule was "…struck down as unlawful by the U.S. Court of Appeals for the D.C. Circuit. See North Carolina v. U.S. Environmental Protection Agency, 550 F.3d 1176 (D.C. Cir. 2008)" and that EPA is in the process of developing a new regulatory program, the Transport Rule (EPA, "Air Transport," at http://www.epa.gov/airtransport/). Respondents also stated that the PSD permit should emphasize that a source fulfilling its obligation under any other regulatory requirement (e.g., CAIR, the Transport Rule) cannot be used to "count" as an offset.

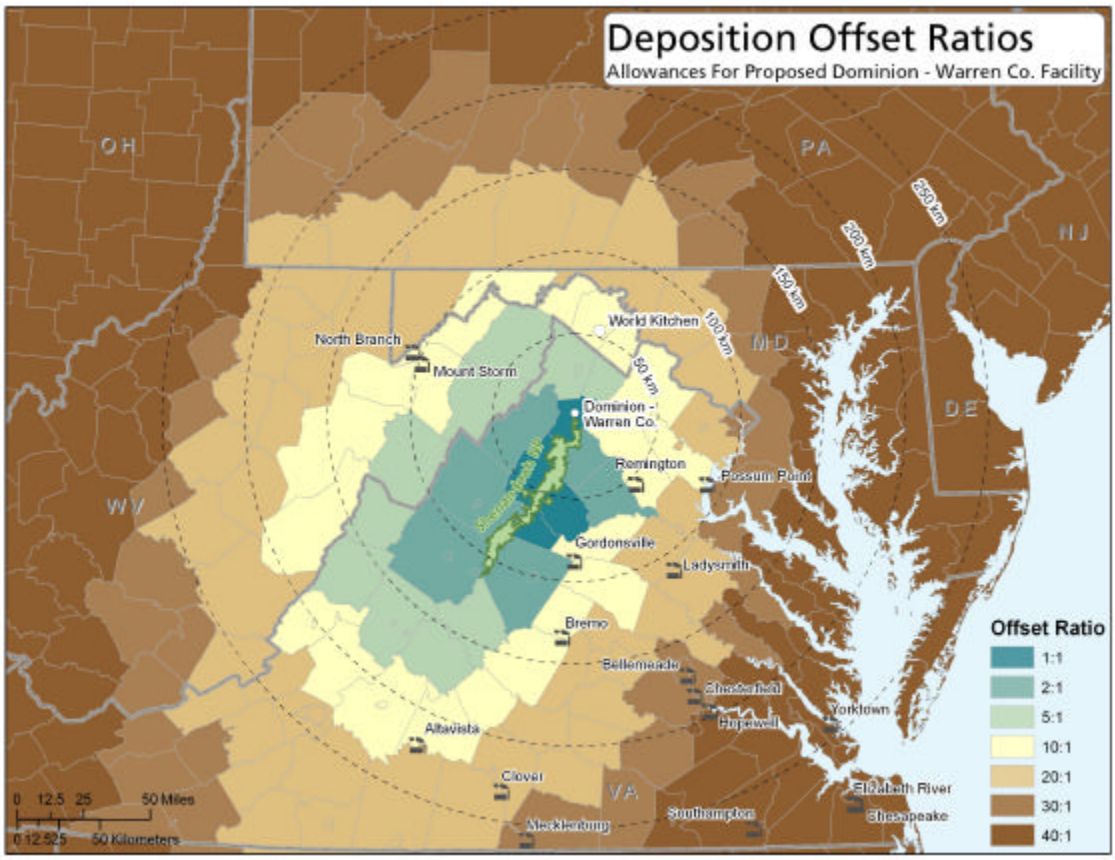
Several respondents expressed concern that the draft permit contains enforceable offsets at a 1.15 to 1 ratio and that the NPS desired a higher level of offset (and closer to the SNP) to protect Park resources. Respondents reiterated the desire for DEQ to follow the recommendation of the NPS and make the desired offsets enforceable in the permit.

Response: DEQ has strengthened the mitigation plan in the draft permit based on comments received from the NPS and the general public. The elements of the revised mitigation plan are as follows:

1. *Dominion shall permanently cease all permitted SO_2 and NO_X emissions at North Branch Power Station in Grant County, West Virginia. Based on the actual emissions in 2007-2008 and the distance and direction of North Branch Power Station from the Park these reductions shall result in an Emission Offset of 243 TPY that is applied to the total annual NO_X limit. Specifically, these emissions are being offset at a ratio of 10:1 based on the modeling conducted by the NPS. Neither the permitted nor actual SO_2 and NO_X emission reductions from the North Branch Power Station may be used as Emissions Offsets for any other purpose.*

2. *Dominion shall retire permanently the 175 TPY of NO_X offsets procured from World Kitchen in Martinsburg, West Virginia, as approved by the DEQ by letter of 11/17/07. Based on the distance and direction of World Kitchen from the Park, this retirement of emission reduction credits shall result in 17.5 TPY emission offsets toward the total annual NO_X limit. Specifically, these emissions are being offset at a ratio of 10:1 based on the modeling conducted by the NPS.*

3. *Dominion shall secure and retire Eligible SO_2 Allowances, Eligible NO_X Allowances, or Emission Reduction Credits in the amount equivalent to 70.2 TPY of Emission Offsets toward the total annual NO_X limit. An offset ratio map, developed based on modeling conducted by the NPS, is provided below.*



The map depicts much higher offset ratios than originally proposed in the draft permit.

Both DEQ and the NPS conclude that the mitigation plan fully addresses acidic deposition impacts within the SNP. The geographic region where emissions affect the SNP is relatively large and the offset ratios contained in the final draft permit are appropriate based on the modeling results for this project.

DEQ also believes that the offsets, including a <u>minimum</u> regional reduction of 1,582 tons of NOx (1,407 tons from North Branch based on 2007-2008 emissions and 175 tons from World Kitchen), address concerns expressed about ozone formation within the SNP and nearby localities (additional discussion on this topic is provided under Issue 6: Ozone). The mitigation plan includes a requirement that the emissions reduction has not been and will not be credited toward another reduction requirement.

Issue 4: Best Available Control Technology (BACT)

4(a) Combustion turbines: NO_X short-term limit

Comment: Dominion-WCPS's draft permit requires control of NO_x emissions from the combustion turbines to 2.0 ppmvd (excluding startup and shutdown), calculated as a one-hour average. There have been suggestions that, in addition to the currently proposed limit, a NO_x emission limit of less than 2 ppmvd at 15% O_2 could be achieved. The basis for this suggestion is believed to be one vendor's online documentation that it is possible to achieve up to 95% control of NO_x control by the SCR system.

Response: BACT is determined on a case-by-case basis and must be achievable and enforceable. DEQ's BACT analysis determined that a combination of dry low-NOx combustion and SCR to control NO_x emissions from the combustion turbines and duct burners to 2.0 ppmvd at 15% O_2 is BACT for WCPS. A review of other similar facilities and the RACT/BACT/LAER Clearinghouse (RBLC) does not show that a lower emission limit has been demonstrated. Based on our BACT analysis, DEQ does not agree that a lower NO_x short-term limit is consistently achievable. Supporting documentation can be found in Dominion's Responses to Comments document dated December 3, 2010.

4(b) Choice of turbine manufacturer

Comment: While the FLM agrees with the type of control technologies (e.g., Selective Catalytic Reduction) selected by Dominion for the combined-cycle combustion turbine, it believes that the WCPS could achieve lower emission limits by choosing an inherently cleaner combustion turbine or reducing the size of the project. The FLM provides a table showing the NO_x and PM-10/PM-2.5 emissions on a lb/hr per turbine basis for Mitsubishi, Siemens, and GE.

Response: In the initial application packages, all three turbine manufacturers were included as possible choices. On September 1, 2010, Dominion requested the withdrawal of the applications for Siemens and GE, thereby leaving only the Mitsubishi option. After further discussions with Mitsubishi, Dominion has proposed a lower PM-10/PM-2.5 short-term emission limit of 14.0 lb/hr with duct burner firing. This is lower than the short-term emission limit for the Siemens and GE turbines. The NO_x emission rates indicated in the FLM's table are in lb/hr, but do not reflect the fact that the Mitsubishi equipment produces significantly more power than the Siemens or GE equipment. Thus, to pursue equivalent power using either Siemens or GE units, additional turbines, and therefore more emissions, would be required. Dominion states that Mitsubishi has the best heat rate (i.e., the highest fuel efficiency or lowest fuel consumption per unit of output) when compared to the other manufacturers.

EPA guidance outlines a "top-down" BACT analysis that involves identifying all available control technologies, ranking them in order of control effectiveness, and selecting the

most effective option as BACT for each pollutant. The BACT analysis may include inherently lower-polluting processes in the list of BACT candidates; however, in this case, given the higher efficiency of the Mitsubishi units, the alternative engines (Siemens or GE) would result in higher emissions to provide the same power output proposed for the project. In the same November 29, 2010 letter providing comments on the draft permit, the FLM states that "We acknowledge that WCPS would be well-controlled, and we commend Dominion for their efforts in this regard." The combination of the SCR system and dry low-NO_x (DLN) combustors will provide NO_x control to 2.0 ppmvd at 15% O_2 (1-hour average). DEQ has determined that this is BACT for the proposed equipment.

Neither EPA's PSD BACT guidelines nor Virginia PSD regulations include the requirement to consider a reduction in project scope. While Dominion could have voluntarily proposed a reduction in generation capacity in order to mitigate potential impacts on SNP, it instead agreed to a mitigation plan that addresses, to the satisfaction of the FLM, potential impacts to SNP while preserving the proposed generation capacity. The FLM has stated that the mitigation plan agreed to by Dominion will result in a net environmental benefit to SNP and that it therefore does not oppose the proposed permit.

4(c) Combustion turbines: PM-10 and PM-2.5

Comment: Several respondents stated that a separate, independent BACT analysis for direct PM-2.5 controls should be conducted. SELC cited "EPA generally prohibits the use of PM-10 as a surrogate for PM-2.5 in determining what control technologies satisfy the CAA's BACT requirements." One commenter was confused as to how particulate matter was addressed in the draft permit and questioned how the projected annual emission limits for PM-10 and PM-2.5 were calculated.

<u>Response</u>: DEQ agrees that a separate analysis of PM-2.5 should be conducted. PM-10 was not used as a surrogate for PM-2.5 in the WCPS permit application and draft permit (see also Issue 8: Particulate Matter Air Quality Analysis (PM-10 & PM-2.5)). Dominion's BACT analysis concluded that add-on controls for particulate matter (both PM-10 and PM-2.5) (baghouses and electrostatic precipitators) were not feasible. The BACT analyses for PM-10 and for PM-2.5 result in the same conclusion that there are no feasible add-on controls for particulate emissions from combustion turbines. It seems there was some confusion as the PM-10 and PM-2.5 BACT analysis were grouped together in the draft engineering analysis. However, DEQ did the BACT analyses independently. Since the results were similar they were included together in the engineering document. Based upon available information for natural gas combustion, all of the particulate emitted from natural gas combustion is PM-2.5. In AP-42 Section 3.1.3.3 (Stationary Gas Turbines), EPA states that condensable PM is generally considered to be all less than 1.0 micrometers (µm) in aerodynamic diameter and in AP-42 Section 1.4 (Natural Gas Combustion), Table 1.4-2, footnote c, EPA assumes that all PM is less than 1.0 µm in diameter. Therefore, EPA considers all of the PM emissions from natural gas combustion to be less than 2.5 µm in aerodynamic diameter.

Comments received during the public comment period indicate that there was some misunderstanding with regard to the projected total particulate emissions from WCPS. PM-2.5 is a subset of PM-10. It is incorrect to add the projected PM-10 and PM-2.5 annual emissions together. After further discussions with Mitsubishi, Dominion has proposed lower PM-10/PM-2.5 short-term emission limits of 14.0 lb/hr with duct burner firing. Per the draft permit, Dominion is required to perform an initial stack test for PM-2.5 from the combustion turbines when a test method for PM-2.5 has received final approval by EPA. This stack test will determine what percentage of PM-10 is made up by PM-2.5. Footnotes are being added to Conditions 16 and 17 (Short-Term and Annual Emission Limits) of the draft permit that state that the permit may be changed in accordance with 9 VAC 5-80-1925 to reduce the emission limit based on results from PM-2.5 stack testing as required in this permit.

4(d) BACT to LAER

Comment: Several respondents felt that a LAER-type analysis should be conducted due to the WCPS's proximity to the SNP. SELC stated that given the power plant's proximity to several likely ozone nonattainment areas, a LAER-type analysis should be conducted, with particular emphasis placed on protecting the resources of SNP.

Response: A LAER analysis is required of permit applicants located in nonattainment areas. LAER is defined as the lowest emission limit achieved in practice on a similar design and only technical and environmental factors are considered, without regard to cost. The proposed WCPS is located in an attainment area for all NAAQS. Therefore, a LAER analysis is not required for WCPS. It should be noted that the emissions level included in the permit for NO_x (an ozone precursor) is as stringent as recent LAER determinations listed in EPA's RACT/BACT/LAER Clearinghouse.

Issue 5: VOC Emissions

Comment: During the comment period, Dominion was asked whether the proposed VOC emission limits could be reduced with the main focus on the VOC emission rates during startups and shutdowns. Questions have also been raised regarding the number of startup scenarios used to estimate annual emissions from the combined cycle plant.

Response: The projected annual VOC emissions from WCPS include the emissions generated from startups and shutdowns estimated by Dominion as they are higher than VOC emissions during normal operations. The BACT analysis determined that good combustion practices and add-on oxidation catalyst represent BACT for VOC emissions from the combustion turbines. In their comments, Dominion stated that the catalysts do not immediately reach their full VOC reduction potential during a startup because they must warm up before they are

effective in VOC control. At Dominion's request, and with further engineering and environmental analysis, the combustion turbine vendor was able to provide lower estimates of VOC emissions during hot starts because the HRSG temperatures are already within the proper range to allow the oxidation catalysts to reduce VOCs. See further discussion in Dominion's comments from Pamela Faggert dated November 24, 2010. By reducing the estimated VOC emissions during hot starts, Dominion proposes to lower the annual VOC limit from 230.8 tons per year to 181.0 tons per year from the combined-cycle units and duct burners. The annual VOC emission limit in Condition 17 of the draft PSD permit has been changed accordingly.

The facility used 174 hot starts, 15 warm starts, and 6 cold starts to estimate annual emissions. Numerous factors, including weather and gas prices, change the number of starts to meet customer demands. The units cycle more when natural gas prices are high to meet customer and market demand. When natural gas prices are low, the units continue to run for longer periods.

Dominion provided information regarding the number of startups utilized by its Possum Point Unit 6, a combined-cycle facility that is dispatched into the Northern Virginia market. During the period 2007-2008 when the natural gas prices were high, there were an average of 170 hot starts, 47 warm starts, and 16 cold starts. Dominion also provided the number of startups for the period 2008-2010 (see Dominion's response dated November 24, 2010).

Issue 6: Ozone

Comment: Respondents stated that they were "…unaware of potential impacts to existing nonattainment areas and those that are a part of any Early Action Compact (Winchester and Frederick County). But due to the proximity of these impaired airsheds and that of the Shenandoah National Park, VDEQ and the SAPCB must ensure no further decline in air quality and protect against the associated public health and environmental impacts that would occur."

Respondents also commented that natural gas contributes to ground-level ozone pollution. Others commented that "high ozone levels frequently create obscuring smog during the summer" and that it "discourages visits to Shenandoah to enjoy this iconic scenery."

Respondents pointed out that while Warren County is currently designated attainment for ozone based on the 1997 standard, DEQ ignores the fact that there are no monitors in Warren County to directly assess air quality impacts. They point out that monitors nearby indicate "serious problems with ground-level ozone pollution in Shenandoah National Park."

Respondents stated that EPA is in the process of revising the National Ambient Air Quality Standard (NAAQS) for ground-level ozone and that it intends to set the standard between 70 parts per billion (ppb) and 60 ppb. Furthermore, even if EPA selects the most lenient standard option from the proposed options, many areas in the vicinity of Shenandoah National Park will fall into nonattainment.

A few respondents commented that addressing the impact of the proposed project on neighboring ozone monitors should be "of paramount concern to the Air Board."

Response: Respondents correctly point out that Warren County is currently designated attainment for ozone based on the 1997 standard (0.08 parts per million (ppm)) and the 2008 standard (0.075 ppm) and that the 2008 standard is currently being reconsidered by EPA. Specifically, on January 6, 2010, EPA proposed to strengthen the NAAQS for ground-level ozone, the main component of smog. The proposed revisions are based on scientific evidence about ozone and its effects on people and the environment. EPA is proposing to strengthen the 8-hour "primary" ozone standard, designed to protect public health, to a level within the range of 0.060-0.070 ppm. EPA is also proposing to establish a distinct cumulative, seasonal "secondary" standard, designed to protect sensitive vegetation and ecosystems, including forests, parks, and wildlife. At this point, the final outcome of this proposal is not known. The latest information at the time of public notice suggests that the new ozone standards may be finalized by the end of 2010 or early 2011.

Respondents expressed concern that Warren County does not currently have an ozone monitor by which to determine the attainment status of the county and that surrounding localities may be in violation of the new ozone standard when promulgated. The respondents are correct in stating that Warren County does not currently have an ozone monitor. However, both DEQ and EPA use other criteria besides monitoring in making attainment designations. Nine EPA-recommended criteria for establishing the boundaries of nonattainment areas are provided below:

1. *Emissions data*
2. *Air quality data*
3. *Population density and degree of urbanization (including commercial development)*
4. *Traffic and commuting patterns*
5. *Growth rates and patterns*
6. *Meteorology (weather/transport patterns)*
7. *Geography/topography (mountain ranges or other air basin boundaries)*
8. *Jurisdictional boundaries (e.g., counties, air districts, Reservations, metropolitan planning organizations)*
9. *Level of control of emission sources*

While DEQ agrees that the new primary ozone standard may put many Virginia areas into nonattainment, it is unclear at this time what the designation status would be for Warren County. DEQ agrees that more regional/national controls will be needed in order to meet the new standards being developed by EPA.

Although there is currently no ozone monitor in Warren County, DEQ's ozone monitoring network is subject to an annual monitoring plan and periodic network assessment to

determine adequacy (40 CFR Part 58, Ambient Air Quality Surveillance). EPA has determined that the ozone monitoring network satisfies the requirements of 40 CFR Part 58.

The final mitigation plan outlined in Condition 24 of the draft permit provides for regional NO_X emissions offsets or emissions reductions which are at least equivalent to those required in moderate ozone nonattainment area permitting (i.e., offset ratio of at least 1.15 to 1). DEQ believes that the offsets, including a minimum regional reduction of 1,582 tons of NOx (1,407 tons from North Branch based on 2007-2008 emissions and 175 tons from World Kitchen), address concerns expressed about ozone formation within the SNP and nearby localities.

It is important to note that current research demonstrates that rural regions and, in fact, most if not all of Virginia, are considered "NO_X limited" for the purposes of ozone formation. In other words, the concentration of ozone depends on the amount of NO_X in the atmosphere. This occurs when there is a lack of NO_2, thus inhibiting ozone titration when oxygen mixes with VOCs. In these regions, controlling NO_X would reduce ozone concentrations whereas controlling VOCs would have little if any effect on ozone formation. Rural areas are usually NO_X limited due to the large amount of trees that produce relatively high concentrations of VOCs. For instance, the Blue Ridge Mountains are named in part because the high VOC levels reflect blue light. Regions that are "VOC limited" lack trees and are usually congested with high vehicular activity.

In the absence of a nonattainment designation, neither the Clean Air Act (CAA) nor its implementing regulations requires a proposed source to obtain offsets for the purposes of mitigating ozone impacts. What may easily be lost in the offsets discussion is the fact that the proposed facility will be subject to NO_X allowance trading programs (e.g., CAIR, NO_X Budget Trading Program, and the upcoming EPA Transport Rule). These rules are designed to mitigate the transport of ozone and nitrogen oxides and applies to all electrical generating units (EGUs) providing electricity for sale and will significantly improve ozone air quality in all areas of Virginia, including the SNP. Under the provisions of these rules, Dominion is typically required to hold NO_X allowances in an account administered by EPA in an amount not less than the total NO_X emissions that may occur each year during the ozone season (i.e., May 1 through September 30). The amount of NO_X allowances that are available for purchase are capped to result in significant overall NO_X emissions reductions from an established baseline period. Both new and existing EGUs must obtain allowances to operate during the control period from the same cap, ensuring that regardless of the number of new power plants operating, the amount of NO_X emissions will be maintained at or below the cap. Compliance is assessed through continuous emissions monitors and failure to maintain sufficient NO_X allowances in the compliance account is a violation of both State and Federal law subject to enforcement action.

DEQ has historically evaluated impacts from combined-cycle plants of this magnitude to determine the impact on ozone concentrations. As an example, DEQ previously conducted a modeling analysis of fifteen proposed electric generating facilities (including the original CPV Warren project). The combined impact of all fifteen plants on ozone concentrations in Virginia,

including the SNP, was less than 0.001 ppm (8-hour average concentration). The modeling receptor grid in and around the SNP averaged out to approximately 0.0005 ppm. The current ozone standard is 0.075 ppm for comparison.

Respondents expressed concern about ozone formation within the SNP. The Park is unique to Virginia in that it is located at a relatively high elevation. This results in increased susceptibility to ozone and ozone precursor pollutant transport. Both monitoring and limited aerial research of the values recorded at the Big Meadows monitor suggest that this high-level transport is mainly responsible for elevated ozone levels in the SNP. Specifically, SNP is relatively free from local source influences. The Big Meadows site exhibits minimal diurnal variation of ozone concentrations compared to locations near sea level. It is largely free from nocturnal ozone destruction caused by NO_X scavenging and dry deposition that is a characteristic of most lower elevation sites. This is confirmed by the fact that many times when ozone exceedances are recorded at the Big Meadow monitor, these high levels will persist during all hours of the day and night for several days. These elevated ozone levels, even during the night when local ozone formation cannot occur, supports the conclusion that a higher atmospheric ozone transport layer is responsible for much of the ozone problem in the SNP. Under these conditions, local sources of ozone have little or no impact on the SNP.

Issue 7: Visibility Impacts (Coherent Plume Analysis & Regional Haze)

Comment: The NPS analysis of the project's modeling data results in its conclusion that the proposed facility's plume will adversely impact the visibility in the far northern portions of the SNP. The impacts are characterized as infrequent but potentially severe and may negatively affect the visitor's experience at the Shenandoah National Park.

The NPS also acknowledges that all parties (NPS, DEQ and Dominion) have reached a mutually acceptable emissions reduction plan that will result in a net environmental benefit in the SNP. The NPS further states that although plume impacts cannot be directly offset with emissions reductions in other locations, visibility impact concerns may be alleviated if sufficient emission reductions are achieved to demonstrate a net environmental benefit to the SNP.

Several other respondents expressed concern over the project's impact on visibility. One respondent stated that there has been a continued deterioration of air quality and fewer "clear days" over the valley and that any additional plants will only further acerbate the quality impacts. Other respondents commented that the proximity of the proposed plant to Shenandoah National Park and tourists on the Appalachian Trail raises the likelihood of an adverse visual impact on the Park and its resources.

Respondents referenced the requirements of Section 165 of the Clean Air Act, 42 U.S.C. § 7475 and that the NPS is the FLM with the responsibility of protecting the AQRVs (including visibility) of SNP. These respondents commented that it is essential that DEQ staff, the SAPCB, and Dominion work with the NPS to assure that SNP is fully protected. Furthermore, these

respondents stated that if the NPS makes an adverse impact finding and concludes that the power plant's impacts cannot be mitigated, then the SAPCB should reject Dominion's application.

Respondents referenced the many overlooks along the Skyline Drive and that the SNP was constructed for visitors to enjoy the scenic views; therefore, building a major industrial facility with its associated plumes near the SNP is inconsistent with protecting the quality of that experience.

Response: It is important to understand that visibility impacts are typically characterized using two criteria: (1) regional haze and (2) coherent plume impacts (plume impairment). Each of these criteria, as it pertains to the Dominion Warren project, is discussed in detail below.

(1) Regional Haze

Regional haze is pollution from disparate sources that impairs visibility over a large region, including national parks, forests, and wilderness areas (federal "Class I" areas). Regional haze is caused by sources and activities emitting fine particles and their precursors (e.g., sulfur dioxide, nitrogen oxides). Those emissions are often transported over large regions. Due to these factors, the regional haze modeling analysis for a Class I area under PSD is conducted only for areas beyond 50 kilometers from the proposed source. Beyond a distance of 50 kilometers, the individual plume being emitted is no longer "coherent" but would contribute to regional haze. A coherent plume analysis is required to address visibility impacts within 50 kilometers of a proposed source (see (2) Coherent Plume Visibility Analysis (Plume Impairment) discussion below).

Both the NPS and DEQ agree that regional haze impacts from the proposed project are expected to be minimal. DEQ concurs with the NPS regional haze modeling results which indicate that the predicted haze impacts are below the NPS's threshold of a 5 percent change in extinction, and therefore are considered insignificant. The implementation of the mitigation plan contained in the draft permit is also expected to improve regional haze and result in a net environmental benefit to the SNP and neighboring jurisdictions.

Reducing fine particles in the atmosphere is generally considered to be an effective method of reducing regional haze, and thus improving visibility. The proposed facility meets all applicable air quality standards and PSD increments for fine particles and its precursor emissions. Additionally, Best Available Control Technology is required and included in the permit for all of these pollutants.

(2) Coherent Plume Visibility Analysis (Plume Impairment)

The coherent plume visibility analysis for the proposed project was performed with the EPA's PLUVUE II model following the guidance in both the Federal Land Managers' Air Quality Related Values Work Group (FLAG 2000 and FLAG 2010) documents. The coherent plume analysis was conducted because the source is located less than 50 kilometers from the

SNP. The analysis followed the modeling protocol that was approved by the NPS and utilized five years of National Weather Service (NWS) meteorological data. Only daylight hours were evaluated since the plume would not be visible to the observer at night. Five observer locations were selected by the NPS to evaluate whether a coherent plume could be seen within the boundaries of the SNP. These locations are Shenandoah Valley Overlook, Dickey Ridge, Signal Knob Overlook, Compton Gap Road, and Lands Run Road Gate. The PLUVUE II model calculates one-hour impacts at the each of the five observer locations. The plume is transported and dispersed based on wind speed and direction, and atmospheric stability and the final plume rise from the stack.

There are two parameters used to evaluate the coherent plume impacts:

1. ***Plume contrast (|C|)**: Contrast can be defined at any wavelength as the relative difference in the intensity (called spectral radiance) between the viewed object (e.g., plume) and its background (e.g., sky). Plume contrast results from an increase or decrease in light transmitted from the viewing background through the plume to the observer.*

2. ***Plume perceptibility (?E)**: A parameter used to characterize the perceptibility of a plume on the basis of the color difference between the plume and a viewing background such as the sky, a cloud, or a terrain feature.*

A summary of the PLUVUE II modeling results at each observer location as provided by NPS, along with the number of hours where each of the visibility criteria is exceeded, is presented in the table below.

	Total During 5-Year Period			**Annual Average**		
View Point	**Days**	**|C| Hours**	**?E Hours**	**Days**	**|C| Hours**	**?E Hours**
Signal Knob Overlook	*26*	*29*	*5*	*5*	*6*	*1*
Dickey Ridge	*14*	*16*	*3*	*3*	*3*	*1*
Compton Gap Road	*14*	*15*	*0*	*3*	*3*	*0*
Lands Run Road Gate	*8*	*8*	*5*	*2*	*2*	*1*
Shenandoah Valley Overlook	*3*	*3*	*0*	*1*	*1*	*0*
Totals	*65*	*71*	*13*	*14*	*15*	*3*

The NPS evaluates the coherent plume impacts based on three criteria, namely (1) frequency, (2) duration, and (3) magnitude. The NPS concludes that the coherent plume impacts occur infrequently. They also state that, with the exception of a few 2-hour events, the duration of the impacts is not more than one hour. The NPS' concern with respect to the coherent plume impacts is based on the magnitude of the impacts. The NPS and DEQ agree that the values calculated for a few of the hours are large. For example, six of the hourly impacts over the 5-

year period at the Signal Knob Overlook, as predicted by PLUVUE II, are an order of magnitude over the applicable thresholds. The largest |C| impact is 40 times the threshold and the largest ?E impact is four times the threshold. DEQ also concurs with the NPS that some of these predicted impacts occur during September and October during the peak visitation period in the SNP.

It is important to note that the PLUVUE II modeling results are based on conservative assumptions. The model uses a monochromatic background (e.g., white, grey, black or sky (blue)) and the SNP background consists of a multi-colored background. This would result in the plume being less visible than predicted by the model. Additionally, the modeling results indicate that the plume is much less visible against the sky background than the terrain background. The applicant speculates that due to the elevated nature of the proposed facility's combined-cycle stack plumes, it is more likely to be viewed against the sky background.

The NPS concluded the visibility impacts adversely affect visibility along Skyline Drive as a result of the magnitude of the impacts. The NPS also acknowledges that these impacts would be infrequent. The conclusion that the coherent plume from the proposed plant adversely affects visibility based on the magnitude of the impacts is a value judgment made by the NPS. DEQ agrees that the visible plume impacts cannot be directly mitigated by emission reductions from other sources in other locations.

In order to address the NPS concerns, all parties (NPS, DEQ and Dominion) have reached a mutually acceptable emissions reduction plan that will result in a net environmental benefit in the SNP. As previously noted, plume impacts cannot be directly offset with emissions reductions in other locations. However, visibility impact concerns have been alleviated because all parties agree that sufficient emission reductions are included in the permit that demonstrate a net environmental benefit to the SNP.

Issue 8: Particulate Matter Air Quality Analysis (PM-10 & PM-2.5)

Comment: Respondents stated that PM-2.5, or fine particulate matter, can penetrate deep into the lungs, enter the blood stream, and cross the blood-brain barrier. As a result, PM-2.5 pollution causes more frequent and severe adverse health effects than PM-10.

Respondents commented that EPA has recognized a significant correlation between elevated PM-2.5 levels and premature mortality. Older adults, people with heart and lung disease, and children are particularly sensitive to PM-2.5 exposure.

Respondents pointed out that particulate matter is a significant contributor to regional haze in the national parks and that the visibility in the SNP is already suffering from power plant pollution.

Respondents expressed concern that DEQ may have used PM-10 as a surrogate for PM-2.5 and that EPA generally prohibits this approach.

Respondents were concerned that no analysis was required for demonstrating compliance with the annual PM-10 NAAQS because the standard was revoked by EPA in 2006. Similarly, concerns were raised that no PSD increment analysis was required for PM-2.5 and that on October 20, 2010, EPA published its Final Rule on PM-2.5 implementation in PSD areas. The rule establishes increments, significant impact levels (SILs), and a significant monitoring concentration (SMC) for fine particulate matter. The respondents request that DEQ, Dominion, and the SAPCB conduct an analysis of PM-2.5 Class I increment consumption at SNP.

Respondents commented that "despite offsets and clean technology, there will still be particulate matter that goes into the air."

Response: *DEQ strongly agrees with respondents with regard to the deleterious health effects of PM-2.5 and the Department is fully committed to ensuring that Virginia attains all quality standards for particulate matter (i.e., National Ambient Air Quality Standards and PSD increments).*

DEQ also agrees with the observations made by respondents that particulate matter is a significant contributor to regional haze in the national parks and that the visibility in the SNP is already suffering from pollution, including power plant emissions (see Issue 7: Visibility Impacts (Coherent Plume Analysis & Regional Haze) for additional information on this subject).

DEQ did not use PM-10 as a surrogate for PM-2.5 in the air quality analysis (also see Issue 4(c) BACT - Combustion turbines: PM-10 and PM-2.5). Individual PM-10 and PM-2.5 analyses were performed as outlined in DEQ's staff analysis. The modeling demonstrates compliance with the applicable NAAQS and PSD increments as illustrated in the table below.

NAAQS Modeling Results for Particulate Matter

Pollutant	*Averaging Period*	*Modeled Concentration From All Sources ($\mu g/m^3$)*	*Ambient Background Concentration ($\mu g/m^3$)*	*Total Concentration ($\mu g/m^3$)*	*NAAQS ($\mu g/m^3$)*
PM-10	*24-hour*	*4.98*	*34.7*	*39.68*	*150*
PM-2.5	*24-hour*	*4.38*	*28.0*	*32.38*	*35*
	Annual	*0.48*	*11.7*	*12.18*	*15*

Class I PSD Increment Modeling Results for Particulate Matter

Pollutant	*Averaging Period*	*Modeled Concentration From All Sources ($\mu g/m^3$)*	*Class I PSD Increment ($\mu g/m^3$)*
PM-10	*24-hour*	*5.15*	*8*
	Annual	*0.27*	*4*

Class II PSD Increment Modeling Results for Particulate Matter

Pollutant	*Averaging Period*	*Modeled Concentration From All Sources ($\mu g/m^3$)*	*Class II PSD Increment ($\mu g/m^3$)*
PM-10	*24-hour*	*4.98*	*30*

Respondents are correct that no analysis was required for demonstrating compliance with the annual PM-10 NAAQS because the standard was revoked by EPA in 2006. It is also important to note that the proposed project's impacts were insignificant for annual PM-10 in the Class II area; therefore, the Class II area cumulative source annual increment analysis was not required.

DEQ has reviewed EPA's recently issued final rule for PSD increment for $PM_{2.5}$ ("$PM_{2.5}$ Increment Rule", 40 CFR 52.12(b)(14(c)), 75 Federal Register 64864, 64890 (Oct. 20, 2010)). The PM-2.5 Increment Rule has a "trigger date" of one year from that publication (i.e., on October 20, 2011), at which time the increment will commence to be implemented through the PSD permitting process (Id. at 64887). After that date, a PSD permit applicant must demonstrate that emissions from the proposed source will not cause or contribute to a violation of PSD increment for PM-2.5 (Id. at 64887-64888). Computer modeling is used to determine in the permitting process whether a project causes or contributes to a predicted violation of PSD increment. EPA has stated to DEQ that the applicant is legally not required to make that demonstration if the permit is issued before the trigger date.

Even though the trigger date is not until October 20, 2011, the PM-2.5 Increment Rule establishes the date of publication, October 20, 2010, as the "major source baseline date." (Id. at 64887). New emissions from major stationary sources that occur after this date (i.e., the proposed Dominion Warren facility) will not be included in the baseline, but instead, will consume increment even though they are permitted before the trigger date (Id. at 64868 and 64887). Similarly, any reduction in emissions from a unit in the baseline after the major source baseline date will expand increment (Id. at 64868).

As previously stated, the applicant is not required to model for compliance with PM-2.5 increment before the trigger date. Furthermore, an increment analysis would typically not be initiated in the future unless an additional application is filed after the trigger date to permit a source located in an area that would require the inclusion of the proposed plant in future modeling, as a nearby increment-consuming source. In fact, should the proposed plant be approved and commence operations, its emissions would be included in the modeling inventory of existing sources at its actual operating rate (40 CFR, Part 51 App W Table 8-2).

The applicant volunteered to do the PM-2.5 increment modeling analysis at the suggestion of DEQ to get an understanding of what conditions would be necessary to comply upon the effective date of October 20, 2011. DEQ has reviewed and approved this analysis which is consistent with the approved modeling methodology contained in the permit application. The proposed facility has voluntarily accepted the limit below to comply with the PM-2.5 increment:

- *The duct burners shall not operate between the hours of 10 p.m. and 5 a.m. during the period between September and April.*

DEQ advised the applicant that modeling could be required to demonstrate compliance after the trigger date. The applicant conducted the modeling early and has accepted the aforementioned condition. DEQ has reviewed and approved this modeling and concurs that the restrictions will achieve compliance with the PM-2.5 increment at this time.

Issue 9: Mercury Emissions

Comment: Questions were raised about the amount of mercury emissions that will be emitted from the WCPS.

Response: Dominion's permit application included an evaluation of regulated toxic pollutant emissions, including mercury, from the proposed power plant. The estimated maximum mercury emissions from the natural gas-fired turbines, auxiliary boiler, and fuel gas heater combined were based on AP-42 Chapter 1.4 (Natural Gas Combustion) and are 0.00271 pounds per hour and 2.61 pounds per year (0.00130 tons per year). Dominion did not include estimated mercury emissions from the emergency equipment as there are no emission factors listed in AP-42 for diesel engines. At DEQ's request, Dominion calculated the mercury emissions from the emergency equipment (generator and fire water pump) to be located at the WCPS site using AP-42, Table 1.3-10 (Fuel Oil Combustion). The projected hourly emissions of mercury from the emergency equipment are 0.0000576 pounds per hour. Based on the operational limit of 500 hours per year for each engine, the total for both pieces of emergency equipment was 0.033 pounds per year (0.0000165 tons per year). Therefore, the projected total mercury emissions for the facility are 0.00277 pounds per hour and 2.64 pounds per year (0.00132 tons per year). The

facility's mercury emissions are below the hourly and annual state exemption levels of 0.0033 pounds per hour and 0.00725 tons per year.

Issue 10: Scenic Viewsheds / Visibility of Stacks from Historic Sites

Comment: Respondents contend that scenic viewsheds will be impaired and the stacks will be visible from nearby historic sites. PEC and other respondents requested DEQ solicit comments from other affected state agencies tasked with protecting scenic and historic resources.

Response: The PSD regulations applicable to Dominion's permit application do not include provisions to solicit comments specifically from other state affected agencies; however, any agency or other interested party having reservations about a proposed project may express its concerns during the public comment period required under the PSD rule. DEQ followed the public participation procedures of the PSD regulations and did not receive any comments from other state agencies. Please note that the stack heights were approved in the Conditional Use Permit (CUP) dated July 20, 2010 by the Warren County Board of Supervisors (BOS). The approved heights have not changed from the project's original design approved by the Warren County BOS on December 21, 2001. The heights of the stacks and other structures at this facility are consistent with regulations promulgated by EPA for Good Engineering Practices to prevent downwash from the facility. These regulations are designed to optimize pollutant dispersion and minimize air quality impacts.

Issue 11: Size of Facility/Need for Increased Electric Power/Alternative Energy/Retirement of Older, Coal-Fired Units/Power Lines

Comment: Respondents maintain the size of the plant is too large and they expressed concern that the size of the plant has doubled from the initial project. Some respondents felt that the power to be produced by the proposed facility is not needed and questioned the demand for the increased power generation. One comment was received that stated the power lines are insufficient and new ones will be required.

Respondents stated that DEQ must require that coal unit retirements be specifically identified and made enforceable as a condition of any final PSD permit. Several comments were received that felt that Dominion should use alternative, renewal energy sources such as solar and wind energy. The respondents also suggested that improved efficiency to reduce the need for fossil-fueled generation should be a priority of the applicant.

Several respondents stated that the proposed project would likely provide energy to other parts of the country while Virginia will suffer the effects of the emissions. Also, PEC stated that the "import" of electricity into the state is not an air quality issue.

Response: Neither EPA's PSD BACT guidelines nor Virginia PSD regulations include the requirement to consider project scope, including the size of a facility and how or where the product will be used. Air quality analyses were conducted in accordance with Virginia and federal PSD permitting regulations and guidance in order to assess compliance of projected emissions from the proposed facility with all applicable National Ambient Air Quality Standards (NAAQS) and PSD increments. Please note that the size and scope of the project were approved in the Conditional Use Permit dated July 20, 2010 by the Warren County Board of Supervisors. Dominion has responded that the WCPS will interconnect to the existing transmission lines at the site. Dominion also stated that the existing line is suitable and therefore, no new transmission lines will be needed.

Consideration of the need for the product of a proposed facility is not part of the PSD permitting process. The State Corporation Commission (SCC) is the regulatory body having the authority to assess the need for and benefits of a proposed electric generating facility. A source must have SCC approval prior to beginning construction. Dominion has stated that their Integrated Resource Plan filed with and approved by the Virginia SCC includes the WCPS coming online by 2015.

Consideration of the need to retire coal fired units is not part of the PSD permitting process. However, the proposed mitigation plan in the draft permit requires Dominion to secure emission reduction credits equal to the total annual NO_x limit (330.7 tons/yr), according to specified ratios. One of the requirements of the mitigation plan in the permit is to cease emissions of SO_2 and NO_x from Dominion's coal-fired North Branch Power Station in Grant County, West Virginia.

The use of alternative energy sources to replace the type of emission units proposed by the applicant is not an issue considered in the PSD air permitting process. DEQ evaluates the permit application based on the proposed emission units, type of emissions, and the required controls.

DEQ concurs that the "importing" electricity from outside Virginia is not an air quality issue.

Issue 12: General Environmental Impact Issues

Comments: Comments were received concerning the potential for general negative environmental impacts. These comments included: more pollution being introduced into the environment; dirty air; harmful air pollutants, and the variety of air pollutants emitted. There were comments concerning negative impact on national parks from smog, haze, and acid rain. Some comments concerning general environmental impacts referenced the Shenandoah National Park.

Response: Air quality analyses were conducted in accordance with Virginia and federal PSD permitting regulations and guidance in order to assess compliance of projected emissions

from the proposed facility with all applicable National Ambient Air Quality Standards (NAAQS) and PSD increments. Response to comments regarding modeling and the air quality analysis is provided elsewhere in this document.

The NAAQS were established in order to define air quality levels that are protective of public health and welfare, with an adequate margin of safety, from any known or anticipated adverse effects including visibility impairment, damage to animals, crops, vegetation, and buildings. The analyses assessed impacts on local and regional areas including, but not limited to, federal Class I areas within 300 kilometers (186 miles) of the proposed facility. These air quality analyses demonstrated that projected air emissions from the proposed facility would neither cause nor significantly contribute to a violation of any applicable NAAQS or PSD increment.

No specific acid deposition thresholds have been established for PSD Class II areas, including the vicinity of the proposed facility. The PSD regulations, however, require an analysis of the impacts from the proposed facility on soils and vegetation. Results of the analysis identified no adverse impacts on soils or vegetation. Visibility in the immediate vicinity of the proposed facility will be protected by air pollution control requirements and stringent visible emission limits included in the air permit. Details of the soils and vegetation analysis are provided in other sections of this document.

Impacts on acid deposition and visibility from the facility were evaluated as they pertain to Federal Land Manager air quality related values (AQRVs) in the affected Class I areas. As a result of the acid deposition and visibility AQRV analysis, Dominion, DEQ, and the NPS agreed to permit conditions that require reduction and/or mitigation of the potential impacts from the facility. Details of the acid deposition and visibility AQRV analysis are provided in previous sections of this document.

Issue 13: Impacts on Soils, Vegetation & Agricultural Interests

Comments: Respondents stated that the facility's emissions may harm agriculture, including grapes that are grown to support Virginia's wine industry.

Response: PSD regulations require an analysis on sensitive vegetation types with significant commercial or recreational value.

The vegetation analysis compared modeled concentrations against the vegetation sensitivity thresholds contained in the following information sources: (1) the screening methodology provided in the EPA's guidance document for soils and vegetation, "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals (EPA 450/2-81-078)," (2) secondary NAAQS, established to protect public welfare, including protection against damage to crops and vegetation, and (3) plant injury thresholds found in peer-reviewed research articles used in other PSD analyses..

The maximum modeled concentrations from the facility were compared to the lowest concentration found in all three information sources. The results demonstrate that the proposed plant's impacts are well below the sensitive vegetation injury thresholds.

There is an increasing concern about the impact of acidic deposition (i.e., acid rain) on crops and vegetation such as grapes. Specifically, acid rain can penetrate the soil and lower the pH. This can affect soil chemistry and make it difficult to grow crops and grapevines. It is expected that the Class I mitigation plan will also help reduce the impact of the project on agricultural interests (see Issue 2: Impacts on Air Quality Related Values (AQRVs) in Shenandoah National Park (SNP) and Issue 3: Offset Ratios for further information on the mitigation plan).

Ground-level ozone can also adversely affect agricultural resources. Ozone can enter leaves through tiny openings called stomata which can cause deleterious effects on plant photosynthesis, rate of plant production, flowering, and yield. Certain plants such as spinach are very sensitive to ozone, which causes spotting on leaves and making them unmarketable. Acute injury as a result of ground level ozone has also occurred in other crops, including grapes, pumpkins, watermelons, and tomatoes. It is expected that the mitigation plan contained in the permit will offset ozone impacts associated with the proposed project (see Issue 6: Ozone for further information on this topic).

Finally, the soil types in Warren County and adjacent localities in the Shenandoah Valley are generally considered to have a moderate to high buffering capacity and have a higher capacity to absorb acidic deposition without changing the soil pH. Based on the soil types and quantity of emissions from the proposed project, no adverse impact on local soils is anticipated.

Issue 14: Chesapeake Bay

Comment: Respondents expressed concern over the plant's location relative to the Chesapeake Bay watershed. Specifically, one respondent stated that "the plant will be in close proximity to the Shenandoah River which feeds the Potomac which then feeds into the Chesapeake Bay. The Chesapeake Bay watershed is about to go on a "pollution diet". It would be ironic if the effort of Virginia and its neighboring States were undercut by an increase in particulate matter from a triple-sized power station."

<u>Response</u>: The respondent is referring to the proposed Chesapeake Bay Total Maximum Daily Load (TMDL) and Watershed Implementation Plans (WIPs). Under a Virginia consent decree, the Chesapeake Bay TMDL must be established no later than May 1, 2011. The Chesapeake Bay Program's Principals' Staff Committee requested that the TMDL be completed by December 2010. DEQ submitted its WIP and associated TMDL to EPA for review and approval on November 29, 2010. EPA is working with all of the states to meet the accelerated schedule. The TMDL will allocate loadings of nutrients (nitrogen and phosphorus) and sediment to all jurisdictions in the Bay watershed, including New York, Pennsylvania, West Virginia, Delaware, Maryland, Virginia, and the District of Columbia. States in the watershed and the

District of Columbia have committed to have pollution control measures in place no later than 2025 that will lead to the restoration of the Chesapeake Bay.

The proposed TMDL allocates 15.7 million pounds (basin-wide) of atmospheric deposition loads (i.e., impacts resulting from air emissions) direct to the Chesapeake Bay and tidal tributary surface waters. EPA anticipates that this loading cap will be achieved through implementation of Clean Air Act (CAA) regulations by EPA and the States through 2020. The proposed Dominion Warren facility will be subject to these regulations, which include the Clean Air Interstate Rule (CAIR) and the proposed EPA Transport Rule. The Transport Rule is being developed in response to the Court remand of CAIR and will replace CAIR when final. Projected reductions in atmospheric nitrogen deposition loads to the surrounding watershed are already accounted for within the individual jurisdiction and major river basin nitrogen draft allocations.

Additionally, the impact of the proposed project on the Chesapeake Bay is expected to be minimal due to the NO_X mitigation measures contained in the air permit. For example, the North Branch Power Station and World Kitchen NO_X emissions reductions will directly benefit the Chesapeake Bay watershed since these sources are located upwind of the Potomac River Basin and the Chesapeake Bay.

Issue 15: Request Review by State Air Pollution Control Board (SAPCB)

Comment: Respondents want the permit to be reviewed by the SAPCB and feel that the permit should be thoroughly vetted by the DEQ, NPS, and SAPCB. SELC requested that the DEQ work with the NPS, SAPCB, and Dominion to improve upon the draft PSD permit. One respondent requested that the DEQ do all diligence to care for air quality and another stated that approval of this project would risk Congressional disgust over environmental protection standards in Virginia.

Response: The DEQ Director has submitted the permit to the SAPCB for consideration pursuant to Virginia Code §10.1-1322.01.F. The SAPCB will consider and act on the permit application and draft PSD permit at its December 17, 2010 meeting.

Issue 16: Procedural Concerns

Comment: The NPS stated concerns that DEQ did not follow proper procedures regarding publication of its Public Notice and the FLM's review of the WCPS application. The NPS pointed out that according to 40CFR51.307, DEQ should have provided the NPS with all information relevant to the permit application within 30 days of receipt and at least 60 days prior to the public hearing, which was held on November 9, 2010. The NPS also stated that DEQ published a public hearing notice without providing the NPS adequate time to conduct a thorough review and therefore, the public was not notified of the concerns of the NPS regarding potential adverse impacts on SNP and the opportunity for informed public participation was compromised. The NPS alleges in its Technical Support Document (TSD) that DEQ did not

provide the necessary PLUVUE II modeling files until September 24, 2010, and its staff analysis and the draft permit until October 7, 2010. The NPS further states that the PLUVUE II modeling files were essential in evaluating the magnitude, frequency, and duration of the plume impacts and that DEQ should have provided the FLM the opportunity to fully analyze the September 24 modeling data and submit a visibility analysis before announcing the public hearing. The NPS alleges that this "compromises the public's ability to comment on this important issue, as envisioned by procedural requirements in the federal regulations."

Response: DEQ disagrees with the NPS assertion that it did not follow proper procedures regarding publication of its Public Notice and the FLM's review of the application. The NPS is correct in stating that according to 40 CFR 51.307, DEQ must provide the NPS with all information relevant to the permit application within 30 days of receipt and at least 60 days prior to the public hearing, which was held on November 9, 2010. This was in fact done and proper procedures were followed. The initial application packages were sent from DEQ to Andrea Stacy (NPS) via U.S. Postal Service on February 17, 2010 and revised application packages were sent to Andrea Stacy (NPS) via U.S. Postal Service on April 29, 2010 and electronically (received per email from Andrea Stacy (NPS) on May 3, 2010). On September 3, 2010 (more than 60 days prior to the public hearing), DEQ provided written notification to the NPS of commencement of their 60-day review period and that all information relevant to the permit application was in their possession (see U.S. Postal Service Certified Mail tracking number 70041350000324209121 – Martha Bogle (NPS)).

DEQ disagrees with the NPS assertion that the opportunity for informed public participation was compromised. In the public notice published October 9, 2010, DEQ stated that the draft permit included a mitigation plan to address potential impacts in the SNP Class I Area and solicited public comment on the mitigation plan. DEQ staff requested public comment specifically on the proposed mitigation plan to address potential impacts in SNP at its public briefing presentation conducted on October 7, 2010. Also, SNP Superintendent Martha Bogle provided oral and written comments at the public hearing on November 9, 2010.

Although the DEQ staff analysis and draft permit are usually provided to the FLM after they are completed – and were provided in this case as well - it should be noted that these documents are not considered information relevant to the permit application as stated in the Code of Federal Regulations and the regulations of the Virginia State Air Pollution Control Board. Additionally, the general public was given the statutory requirement of 30 days prior to the public hearing to comment on the draft permit.

The NPS is incorrect in its statement that the PLUVUE II modeling files were not provided to NPS until September 24, 2010. All modeling files (including PLUVUE II) were in the possession of the NPS by the application completeness determination made on September 3, 2010 (see FEDEX tracking numbers 452661112323 - John Notar (NPS) and 452661112334 - Don Shepherd (NPS)). The documents that were received by the NPS on September 24, 2010 were spreadsheets developed by the applicant in order to expedite the NPS review. Due to apparent NPS resource constraints, the applicant volunteered to provide additional summary

information using the modeling files already in the possession of the NPS. This was done as a courtesy but should not be construed as a required element of the permit application. It should be noted that Dominion's application contained all of the summary tables that were originally required by the NPS as part of the CPV Warren permit application and the additional summary tables submitted on September 24, 2010 were not specifically requested by the NPS in the approved modeling protocol.

DEQ values the vital role of and relies upon the expertise of the Federal Land Manager in evaluating proposals to build or modify facilities that may impact Class I areas. DEQ's effort is to provide all necessary documents in a timely manner to facilitate the FLM's review. As detailed above, the record demonstrates that documentation pertinent to analysis of the WCPS application was provided to NPS in accordance with regulatory requirements. Resolution of the NPS' concerns was reached through an extensive collaborative effort spanning several months, which included numerous meetings, both in person and via telephone, between NPS, DEQ and the applicant. DEQ is pleased that this effort has resulted in a mutually acceptable mitigation plan that will, according to the NPS, provide a net environmental benefit to SNP. DEQ has always strived to maintain open communication between all agencies during the permitting process and will continue to work cooperatively with all agencies on future permit actions.

Issue 17: Loss of Tourism/Declining Interest in Value of Region

Comment: Respondents are worried about loss of tourism and tourism dollars. One respondent stated that this project felt like an "industrial effort to minimize the value of SNP and the surrounding area."

Response: The PSD air permitting program is focused on air quality issues and does not consider tourism. Please note that the project received a Conditional Use Permit from the Warren County Board of Supervisors on July 20, 2010.

Issue 18: Source of Natural Gas

Comment: One respondent questioned the source of the natural gas to be used at the proposed power plant specifically asking whether it would come from fracking in the local Marcellus Shale.

Response: Although the type of fuel used at the facility, its characteristics, and the pollutants created through combustion of the fuel is a focus of the air permitting process, the source of the fuel is not an air quality issue. Dominion has indicated that the natural gas will be delivered to the plant by interstate pipeline.

Issue 19: Cumulative Increment Analysis Inventory

Comment: The NPS states that the results of Dominion's cumulative increment analysis show that the project would not cause or contribute to any NO_2 or PM-10 Class I increment violations at the SNP. The NPS questioned the methods used to determine which sources to exclude from the cumulative analyses-especially sources within 50 kilometers of the SNP.

Response: DEQ agrees with the NPS conclusion that the project would not cause or contribute to any NO_2 or PM-10 Class I increment violations at the SNP. The PSD increment inventories were developed in accordance with EPA guidance (1990 draft "New Source Review Workshop Manual" (NSR Manual)) based on input from Virginia and its neighboring States. The increment consuming sources identified by each State were modeled, including those within 50 kilometers of the SNP.

Additionally, there are many conservative assumptions that were implemented in the development of the PSD increment inventories. In some instances, allowable, permitted or potential-to-emit emissions were identified despite the fact that increment consumption is based on actual emissions. If it was not known whether a particular source was an increment consuming source, it was assumed to consume increment.

Issue 20: 1-hour NO_2 Increment Modeling

Comment: Respondents stated a concern that no increment analysis for 1-hour NO_2 was required because EPA has not yet promulgated these Class I PSD increments.

Response: DEQ agrees with the observation by the respondents that there are no PSD Class I and Class II 1-hour NO_2 increments that have been developed. Therefore, no analysis is required.

Issue 21: In support of project

Comment: Respondents expressed support for the proposed project based on job and business creation, projected tax revenues for the county, and a boost to the local economy. Support for the project was also stated with regard to the cleanliness of the plant relative to other power plants, no NAAQS violation, and the NO_x offsets outlined in the mitigation plan. Some respondents felt that the WCPS would be a net environmental benefit to the region and commended Dominion on working with NPS. One Warren County official stated that the necessary infrastructure was in place (natural gas lines, industrial zoning, high voltage power lines, and rail access) for the proposed plant. The Warren County Administrator stated that conditional use permit approval by Warren County included prohibition of groundwater use, dry cooling, and return of site to prior condition if not used. Some respondents expressed confidence in DEQ and the air permitting process.

<u>Response</u>: The public participation process is designed to solicit input from all concerned citizens. DEQ appreciates comments in support of the project as well as comments expressing air quality concerns.